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**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended) An apparatus for dielectrophoretic separation, comprising:

a fluid flow channel disposed on a substrate, wherein said fluid flow channel is provided with fluid inlet and outlet means in fluid communication with said fluid flow channel, and wherein said fluid flow channel has a plurality of insulating structures disposed therein;

~~an electrode~~ electrodes in electric communication with each fluid inlet and outlet means, wherein the electrodes are positioned to generate a spatially non-uniform electric field across the plurality of insulating structures, and wherein the spatially non-uniform electric field exerts a dielectrophoretic force on a sample undergoing separation; and

power supply means connected to said electrodes to generate an electric field within said fluid flow channel,

wherein electroosmotic flow of a fluid in said fluid flow channel is not suppressed.

2. (original) The apparatus of claim 1, wherein said fluid flow channel is an open channel.

3. (original) The apparatus of claim 1, wherein the substrate is a polymer material.

4. (original) The apparatus of claim 1, wherein the plurality of insulating structures is arranged in an array.

5. (original) The apparatus of claim 1, wherein at least a portion of the cross-sectional shape of the insulating structures in the plane of fluid flow is composed of a circle, a straight line, a cusp, a concave curve, a convex curve, or an acute angle, or combinations thereof.

6. (original) The apparatus of claim 5, wherein the insulating structures comprise circular posts.

7. (original) The apparatus of claim 5, wherein the insulating structures are square posts.

8. (original) The apparatus of claim 1, wherein the insulating structures are joined together.

9. (original) The apparatus of claim 1, wherein the electric field is a substantially constant applied electric field.

10. (original) The apparatus of claim 1, wherein the electric field varies in amplitude and period.

11. (original) The apparatus of claim 1, wherein the electric field has a non-zero cyclic average.

12. (original) The apparatus of claim 1, wherein the electric field is a combination of an electric field that is substantially constant and an electric field that varies in amplitude and period.

13. (original) The apparatus of claim 1, wherein the electric field is aligned at an angle with respect to the array of posts.

14-25. (canceled)

26. (currently amended) An apparatus for concentrating and spatially segregating particles, comprising:

a fluid flow channel disposed on a substrate, wherein said fluid flow channel is provided with first and second ends, and fluid inlet and outlet means in fluid communication with the

first and second ends, and wherein said fluid flow channel has a plurality of insulating structures disposed therein;

~~an electrode~~ electrodes in electric communication with each fluid inlet and outlet means, wherein the electrodes are positioned to generate a spatially non-uniform electric field across the plurality of insulating structures, and wherein the spatially non-uniform electric field exerts a dielectrophoretic force on a sample undergoing separation; and

power supply means connected to said electrodes to generate an electric field within said fluid flow channel, wherein the second end of said fluid flow channel is tapered to concentrate the electric field, and wherein electroosmotic flow of a fluid in said fluid flow channel is not suppressed.

27. (original) The apparatus of claim 26, wherein said fluid flow channel is an open channel.

28. (original) The apparatus of claim 26, wherein the substrate is a polymer material.

29. (original) The apparatus of claim 26, wherein the plurality of insulating structures is arranged in an array.

30. (original) The apparatus of claim 29, wherein the array of insulating structures is shaped so as to concentrate the electric field.

31. (currently amended) An apparatus for dielectrophoretic separation, comprising:

a fluid flow channel disposed on a substrate, wherein said fluid flow channel is provided with fluid inlet and outlet means in fluid communication with said fluid flow channel, and wherein said fluid flow channel has a plurality of insulating structures disposed therein;

~~an electrode~~ electrodes in electric communication with each fluid inlet and outlet means, wherein the electrodes are positioned to generate a spatially non-uniform electric field across the plurality of insulating structures, and wherein the spatially non-uniform electric field exerts a dielectrophoretic force on a sample undergoing separation; and

power supply means connected to said electrodes to generate an electric field within said fluid flow channel,

wherein the insulating structures comprise circular posts.

32. (previously presented) The apparatus of claim 31, wherein the plurality of insulating structures is arranged in an array.

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33-35. cancelled

36. (currently amended) An apparatus for dielectrophoretic separation, comprising:

a fluid flow channel disposed on a substrate, wherein said fluid flow channel is provided with fluid inlet and outlet means in fluid communication with said fluid flow channel, and wherein said fluid flow channel has a plurality of insulating structures disposed therein;

~~an electrode~~ electrodes in electric communication with each fluid inlet and outlet means, wherein the electrodes are positioned to generate a spatially non-uniform electric field across the plurality of insulating structures, and wherein the spatially non-uniform electric field exerts a dielectrophoretic force on a sample undergoing separation; and

power supply means connected to said electrodes to generate an electric field within said fluid flow channel,

wherein the insulating structures comprise square posts having sides that are parallel to the fluid flow channel.

37. (previously presented) The apparatus of claim 36, wherein the plurality of insulating structures is arranged in an array.